Dark-field Zoom Stereo Microscope

INSTRUCTION MANUAL

Model JM

OLYMPUS

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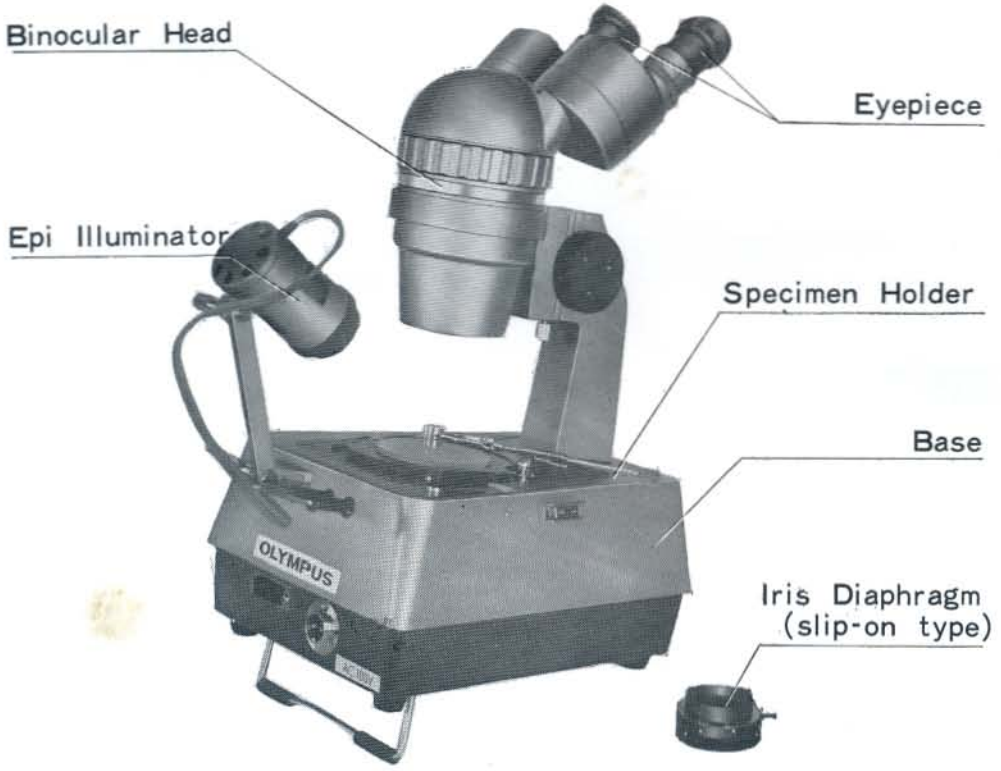
Ⅰ. STANDARD SET

Microscope (Main Body with Binocular Head)	1	set
Stage (With Bright/Dark Field Illuminator, Power Sourse and Arm)	1	set
Eyepieces (G10X and G20X)	1	pair each
Specimen Holder	1	set
Epi Illuminator (LSG-Ⅱ)	1	set
Iris Diaphragm (slip on type)	1	pc.
Stage Glass plates (clear and frosted)	1	pc. each
Eyepiece Caps	2	pcs.
Eye-shades (for G eyepieces)	2	pcs.
Spare Light Bulbs 20W	2	pcs.
6V 12W	2	pcs.
Wooden Case	1	set
Dust Cover	1	pc.
Inspection Certificate	1	copy
Instruction Book	1	copy

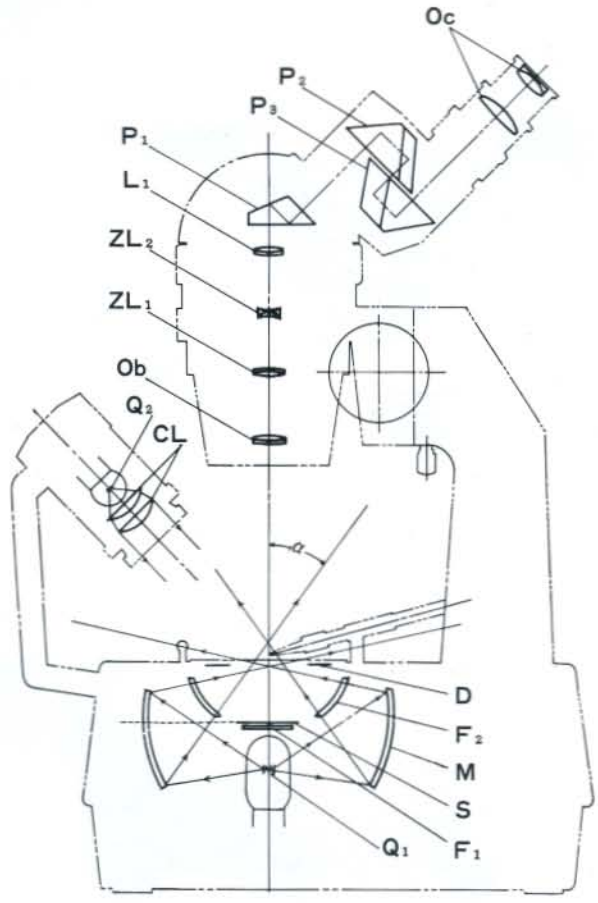
Ⅱ. SPECIFICATIONS

1. Zooming Mechanism : Zoom Ratio 5.7 (Variations0.7X～4X)
2. Total Magnifications : With G10XEyepiece : 7X～40X
   With G20XEyepiece : 14X～80X
3. Inclined Binocular Head :
   Inclination : 45°
   Angle of Visual Axes : 12° (convergent)
4. Range of Interpupillary Distance Adjustment :
   With G10X : 53mm～79mm (exit-pupils)
   With G20X : 49.5mm～75.5mm (exit-pupils)
5. Range of Binocular Head Rotation : 360°
6. Eyepieces : Wide Field G10X (field No. 22)
   Wide Field G20X (field No. 12.2)
7. Working Distance : 88mm
8. Body Movement (Vertical) : 55mm
9. Bright/Dark Field Illumination Device : Iris Diaphragm, Bright/Dark Field Selector Switch
   (100V, 110V, 120V, 220V, 240V, Wattage : 20W)
10. Epi Illuminator : Swivel-joint arm, and focusing mechanism, removable
    6V 12W tungsten filament bulb
11. Power Source : Main Switch, and Selector Switch for 3 different illuminations
    (EPI/EPI-DIA/DIA)
    Built-in low-voltage transformer for oblique illumination.
12. Dimensions : 190mm (w) X310mm(d) X 410mm (h)
13. Net Weight : 8.4kg

Ⅲ. NOMENCLATURES OF MAIN COMPONENTS



Ⅳ. OPTICAL SYSTEM



1. For Observation

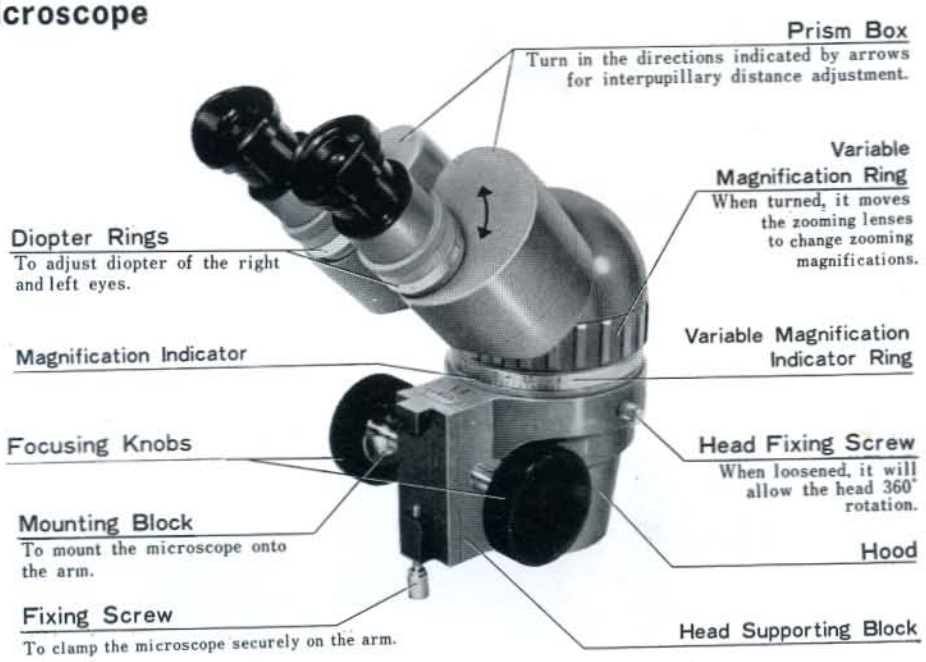
The beam from the specimen enters the observation tube at an angle of 12.° The beam, passing through the objective"Ob,"the zooming variation system"$ZL_1$and ZL_2" and the fixed lens"L_1", reaches the Prism "P_1" where it assumes 45° inclination. Via the porro-prisms "$P_2$and P_3" the beam finally reaches the eyepieces "Oc". Continuous zooming variation is available by means of the ZL lenses.

2. Illuminating System

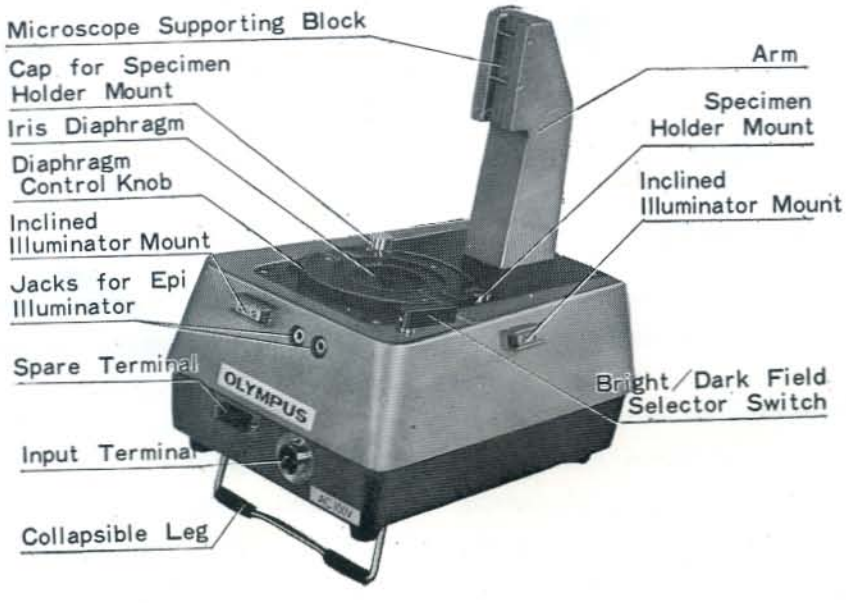
Light emitted from the light source "Q_1" proceeds in two directions, one to illuminate the specimen vertically through the frosted plate "F_1" and the other to be reflected as indicated by arrows on the large reflecting mirror "M" which surrounds the light source. The light reflected on mirror "M" then proceeds through the bowl-like frosted plate "F_2" to illuminate the specimen from the border. When the shutter "S" is stopped down, the vertical illumination is shut off, leaving the border illumination alone, i. e. the dark-field illumination. Further, when the iris diaphragm "D" is stopped down, dark-field effect is increased, because the beams with a small angle α will be stopped. On the other hand, light emitted from the light source "Q_2" proceeds through the condenser lens "CL" to illuminate the specimen from an oblique direction.

V. STRUCTURE

A. Microscope



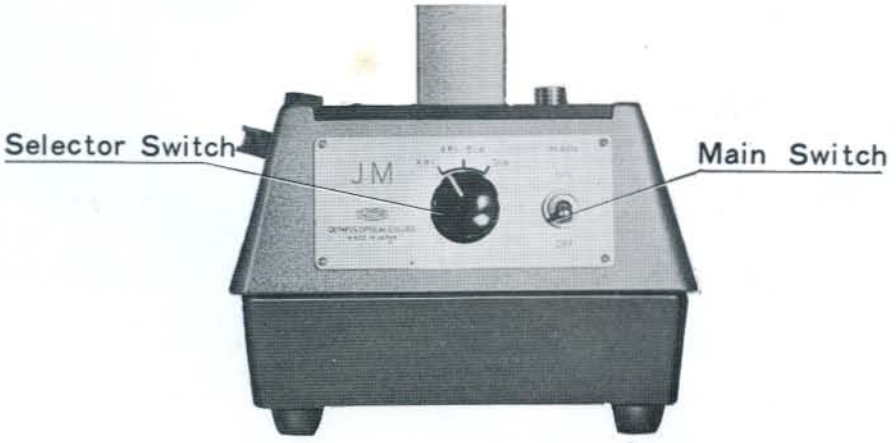
B. Base



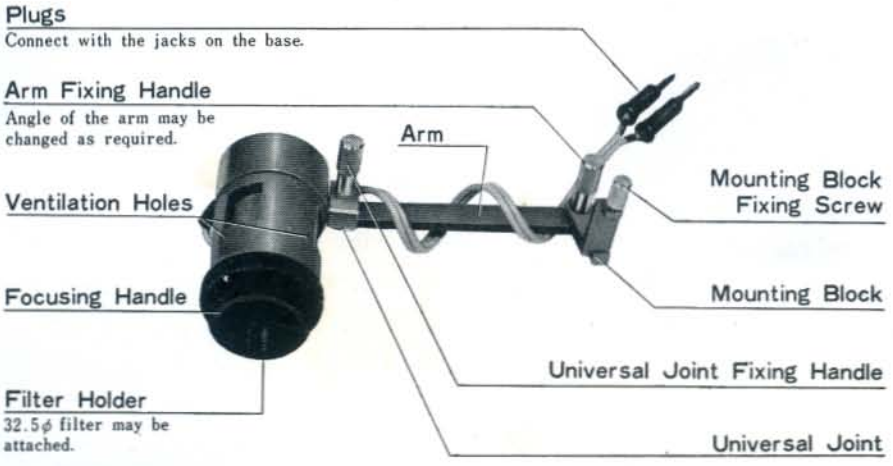
C. Specimen Holder



D. Power Source

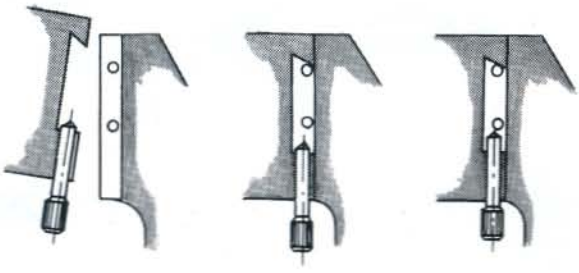


E. Epi Illuminator (LSG-Ⅱ)



VI. ASSEMBLY

1. Set the microscope onto the supporting block of the arm and secure it tightly with the provided screw. (Fig.1)



(Fig.1)

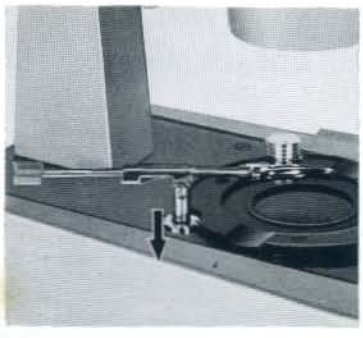
2. The head is clamped with the head fixing screw. (Fig.2)



(Fig.2)

3. Remove the eyepiece caps from the eyepiece tubes and insert proper eyepieces.

4. Install the specimen holder (either at the right or the left mount) (Fig.3)



(Fig.3)

5. Mount the Epi illuminator onto the illuminator mount on the base and tighten the fixing screw. Insert the plugs of the illuminator into the jacks. (Fig.4)

6, Insert the line cord into the input terminal on the base, and screw it securely.
Connect the other plug of line cord to the AC outlet.



(Fig.4)

Ⅶ. OPERATION

1. Turn on the MAIN switch and set the selector switch to the DIA position.

2. Set the Bright/Dark Field Selector Switch to the B position.

3. Place the specimen on the specimen holder, so that it will be positioned about 10mm above the center of the iris diaphragm. (Fig.5)

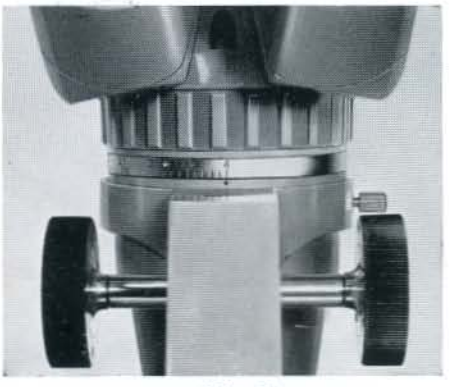


(Fig.5)

4. Dioptric adjustments.

   a. First align the diopter ring on the right eyepiece tube to "O". Set the variable magnification indicator ring at the maximum index of"4". Focus on the sepecimen with the focusing knob. (Fig.6)

   b. Turn the variable magnification indicator ring to the minimum index of "0.7", but do not move the specimen or the focusing knob at this time.



(Fig.6)

   c. If the specimen is out of focus, do not move the focusing knob, but turn the right diopter ring to focus again. (Fig.7)

   d. Now, turn the variable magnification indictor ring to "4".
   If the specimen is still out of focus, repeat steps a. through c. above.

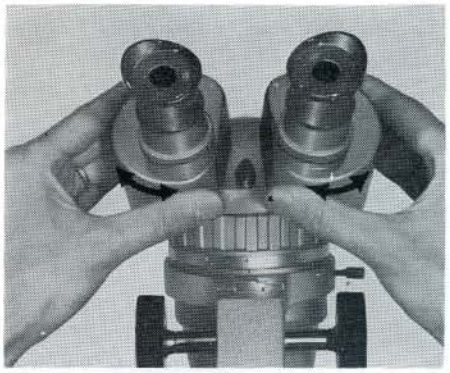
   e. Turn the left diopter ring to adjust the left eyepiece diopter.



(Fig.7)

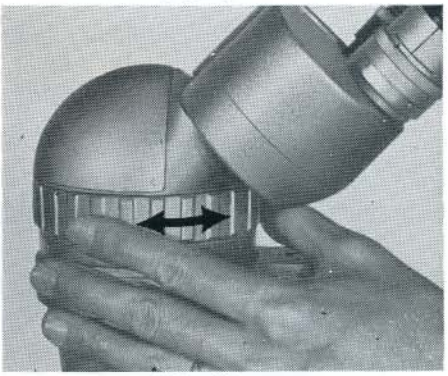
Now both eyepiece tubes have been adjusted to meet your eye acuity. Remember the index numbers on the diopter rings, so that you can always adjust the eyepiece tubes quickly and correctly. In making dioptric adjustments easier, it is advisable to use as thin a specimen as possible or else to choose a specific spot on the specimen to be used as the focusing point.

5. Rotate the prism-boxes(right and left)to adjust the interpupillary distance. (Fig.8)



(Fig.8)

6. Set the variable magnification indicator ring at the required magnification for observation. (Fig.9) Although the specimen may be once set on the stage, illumination effect may be slightly different depending upon the position of the specimen. In such a case, move the specimen slightly while keeping it in focus by the focusing knob.



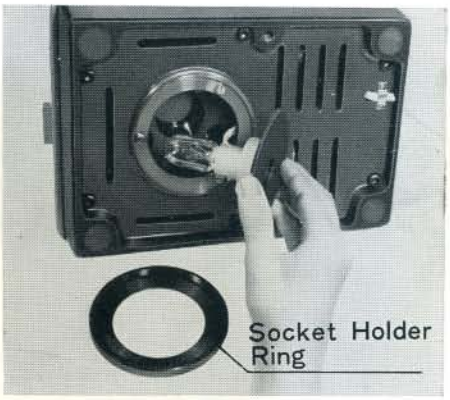
(Fig.9)

7. Set the bright/dark field selector swich to D for the dark-field illumination. The iris diaphragm is used to adjust the angle of dark-field illumination. The more the iris diaphragm is stopped down, the more the illumination is limited,increasing the effect of the dark-fielb illumination.

8. For use of the Epi illuminator, set the selector switch of the power sourse unit to the EPI position. If it is used in combination with the brightfield or darkfield illumination, turn the switch to the EPI-DIA position.
   The focusing handle of the Epi illuminator is able to broaden or narrow down the illuminated area.

9. Bulb Change :
   When the bulb is broken replace it with a new one in the following menner :
   (For Bright/Dark Field Illumination bulb)

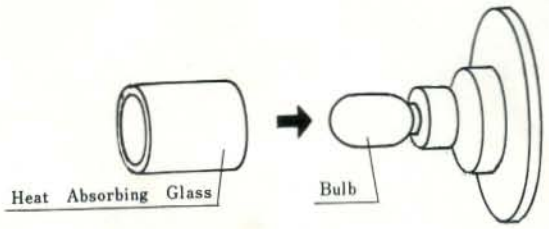
   a. Remove the eyepieces from the eyepiece tubes and take off the whole microscope body from the arm.
   b. Remove the specimen holder from the stage.
   c. Lay down the stage, remove the socket holder ring, and pull out the socket. (Fig.10)
   d. Remove the bulb by turning it counterclock-wise, and replace it.



(Fig.10)

◎Use of Heat Absorbing Glass

This tube covers the bulb of the bright/dark field illumination, and absorbs heat emitted from the illuminator bulb.



(For inclined illumination bulb)

Turn the focusing handle of the illuminator counter-clockwise, and it will be easily released from the illuminator. Then replace the bulb. (Fig.11)



(Fig.11)

10. Use of Iris Diaphragm (slip-in type)

Turn up the Epi illuminator and put the iris diaphragm on it. If you place a gem on the diaphragm and match the aderture of the diaphragm to the size of the gem, switching on the illuminator, it instantly provides a simple method to examine the gem.

Ⅷ. OPTICAL CHARACTERISTICS

Eyepiece	Magnification Indicator Value	Total Magnification	Actual Viewfieid(mm)	Working Distancs(mm)
G10X	0.7	7X	31.4ϕ	88
	1	10X	22.0	〃
	1.5	15X	14.7	〃
	2	20X	11.0	〃
	2.5	25X	8.8	〃
	3	30X	7.3	〃
	3.5	35X	6.3	〃
	4	40X	5.5	〃
G20X	0.7	14X	17.4	88
	1	20X	12.2	〃
	1.5	30X	8.1	〃
	2	40X	6.1	〃
	2.5	50X	4.9	〃
	3	60X	4.1	〃
	3.5	70X	3.5	〃
	4	80X	3.1	〃

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7607 B02 Printed in Japan